



An Advanced Graphics Platform for Embedded Linux

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“Almost every single consumer facing electronic device requires a graphical user interface” - Me.



About FST

- Founded 1995
- Embedded systems specialist since 1995
- Linux 1995
- Based in Sydney, Australia
- Product license sales
 - FancyPants to VeriFone International
- Custom development
 - Embedded Linux / GUI
 - Toshiba, Vodafone, Taxitronic, HPM, Optus, Telstra
- Support
 - Support Toshiba for 7 years for each product

The history of the user interface on a typical consumer electronic device:



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Market Trends

Richer user interfaces

- Less constraints
- More “eye-candy”
- More movement



Further use of video

- Video searching
- Video manipulation
- Object recognition (for still images too)



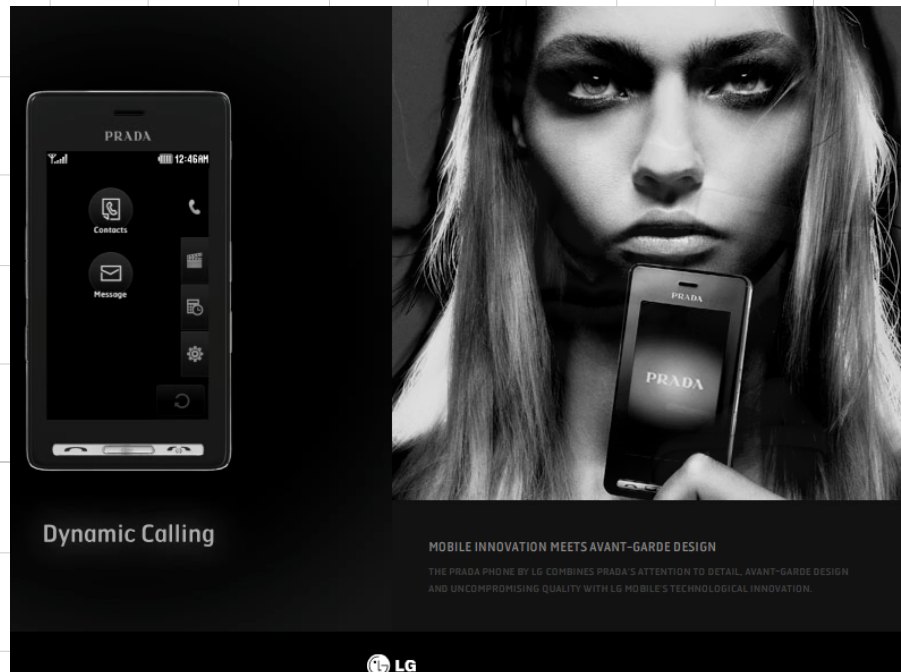
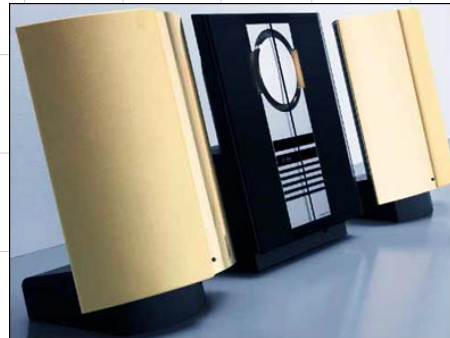
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Market Trends Example: Kiosks



Market Trends

- Fashion
- "Style"



FancyPants Beginnings

TOSHIBA



E17: <http://www.enlightenment.org/>



- ⇒ Open Source project developing the “next generation” desktop for Linux.
- ⇒ Large project with many libraries.
- ⇒ Main libraries used by FancyPants are:
 - Evas – display canvas
 - Ecore – core event loop, ipc, signals, etc.

Evas



- Display canvas
- Non immediate mode
- Compositing with true alpha blending
- Tiling
- Abstracted backends
- Small and fast, suited to embedded

To (sort of) quote Han Solo:

"We've made a lot of special modifications ourselves."

FST works together with the E17 development community.

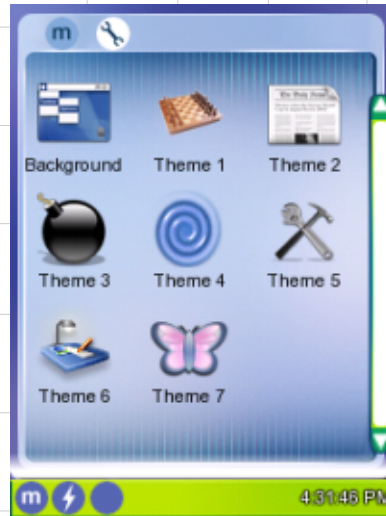
The Enlightenment desktop project has gone through its own evolution:



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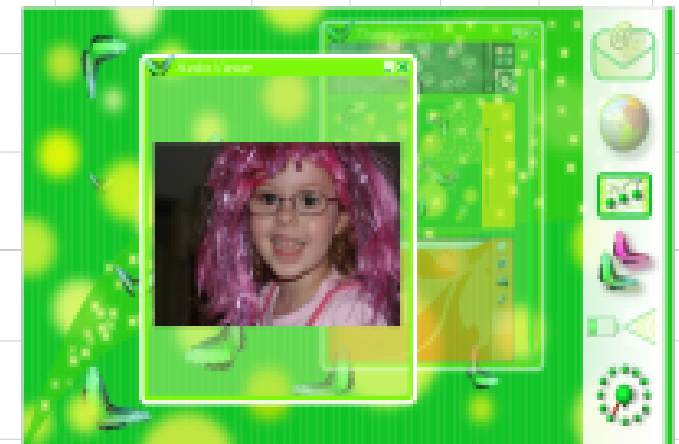
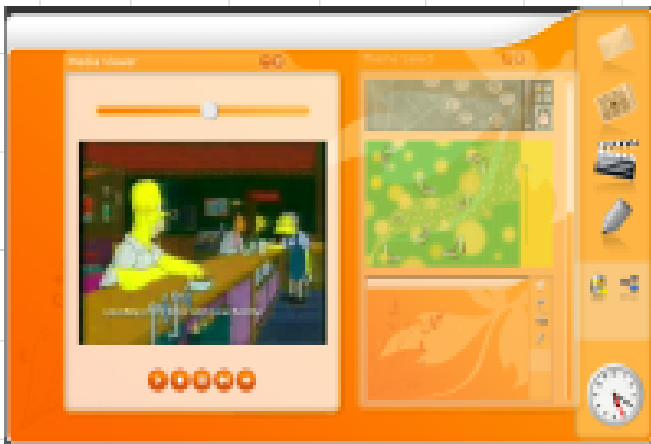
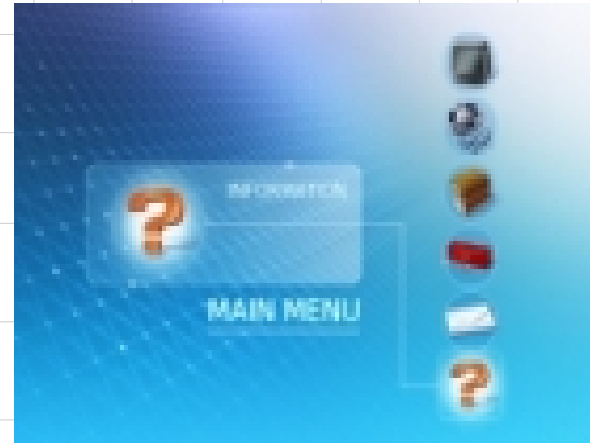
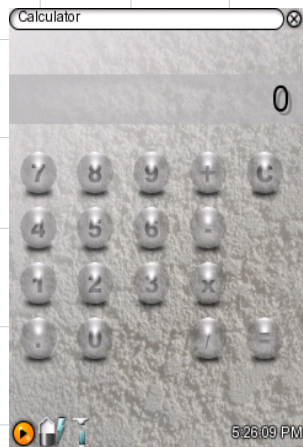
What Is FancyPants?

- ▶ GUI Platform
- ▶ Multi Media

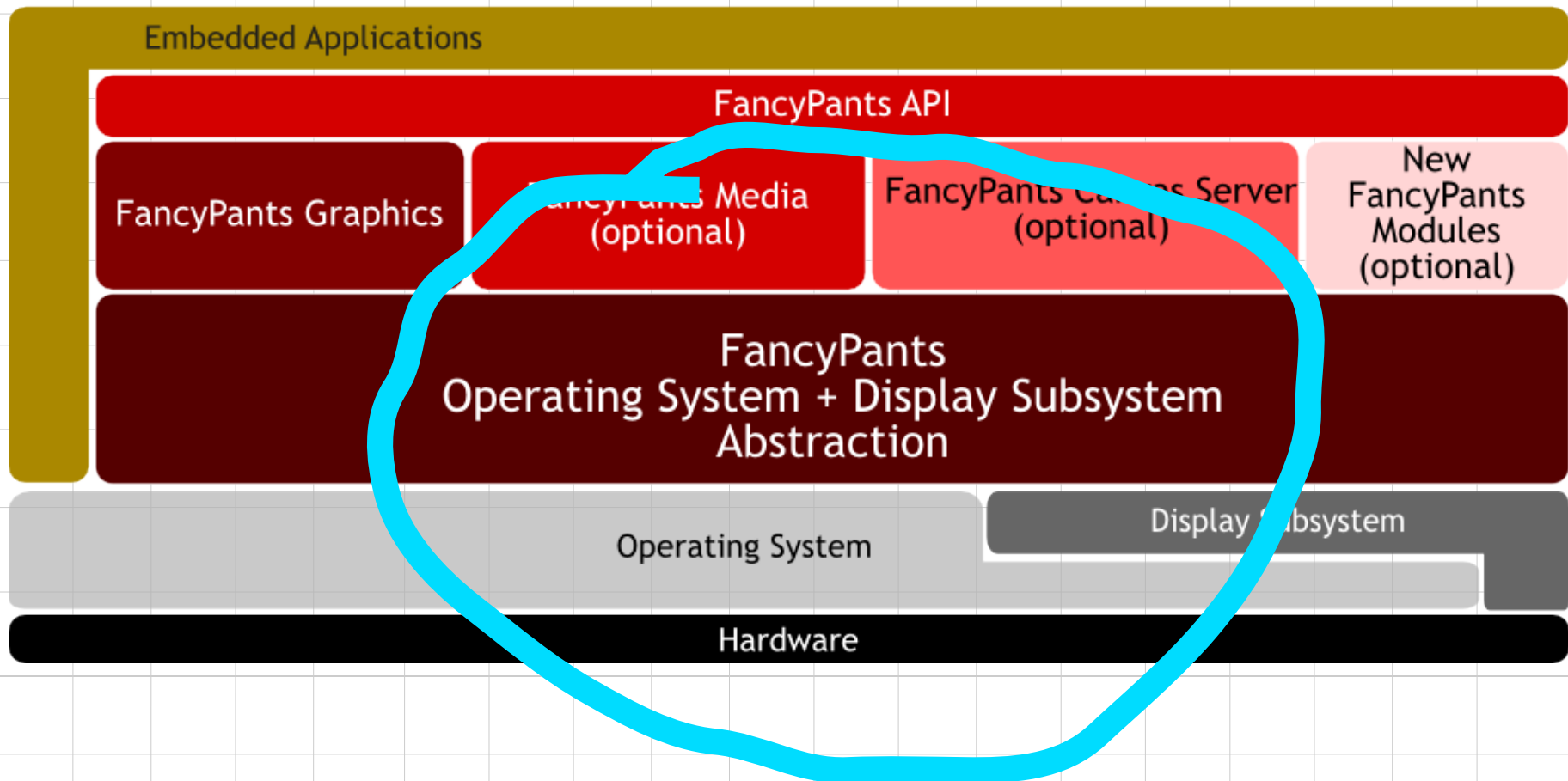


What Else Is FancyPants?

► Designed for embedded



High Level FancyPants Architecture



Portability + Ease of Development

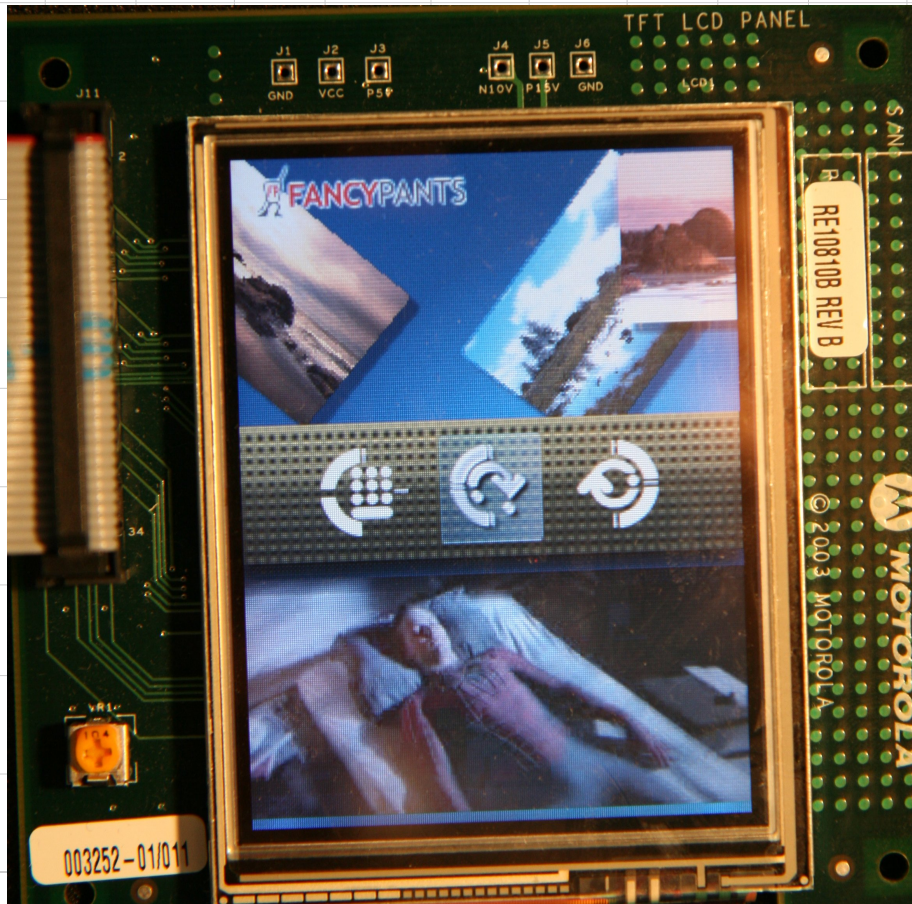
Display System Abstraction:

- ⇒ Linux / X11
- ⇒ Linux / Framebuffer
- ⇒ Linux / DirectFB
- ⇒ Linux / Qtopia

Important for
development

OS Abstraction:

- ⇒ Symbian / UIQ
- ⇒ Win32 / PocketPC / WinCE (v4.x)
- ⇒ L4



Dev. Board

```

launcher.c (~/.work/fancypants/fplaunch/src) - GVIM2
File Edit Tools Syntax Buffers Window Help

Evas_Event_Key_Down *key;
struct launcher *launcher;

key = event;
launcher = data;

/* The APP keys (F1-F4) */
if (key->keyname[0] == 'F' &&
    (key->keyname[1] == '1' || key->keyname[1] == '2' ||
     key->keyname[1] == '3' || key->keyname[1] == '4')) {
    if (launcher->grid || launcher->selected == 0) {
        menu_close(launcher);
        menu_launch(launcher);
    }
    return;
}

if (launcher->grid || launcher->selected == 0) {
    if (strcmp(key->keyname, "F1") == 0) {
        menu_close(launcher);
        menu_launch(launcher);
    }
} else {
    if (strcmp(key->keyname, "F2") == 0) {
        menu_close(launcher);
        menu_launch(launcher);
    }
    if (strcmp(key->keyname, "F3") == 0) {
        menu_close(launcher);
        menu_launch(launcher);
    }
    if (strcmp(key->keyname, "F4") == 0) {
        menu_close(launcher);
        menu_launch(launcher);
    }
    if (strcmp(key->keyname, "Down") == 0) {
        menu_select(launcher, launcher->selected + 1);
    }
    if (strcmp(key->keyname, "Escape") == 0) {
        exit(0);
    }
}

static void
menu_select(struct launcher *launcher, int selection){
    Evas_Coord x,y;

    if (selection < 0)
        selection = 0;
    else if (selection > 2)
        selection = 2;

    if (selection == launcher->selected)
        return;

    fp_fader_add(launcher->bar.clip[launcher->selected], 0);
    fp_fader_add(launcher->bar.icon[launcher->selected], 1);
}
545, 43-50 50%

```


Technical Details: Size

Module

Install Size

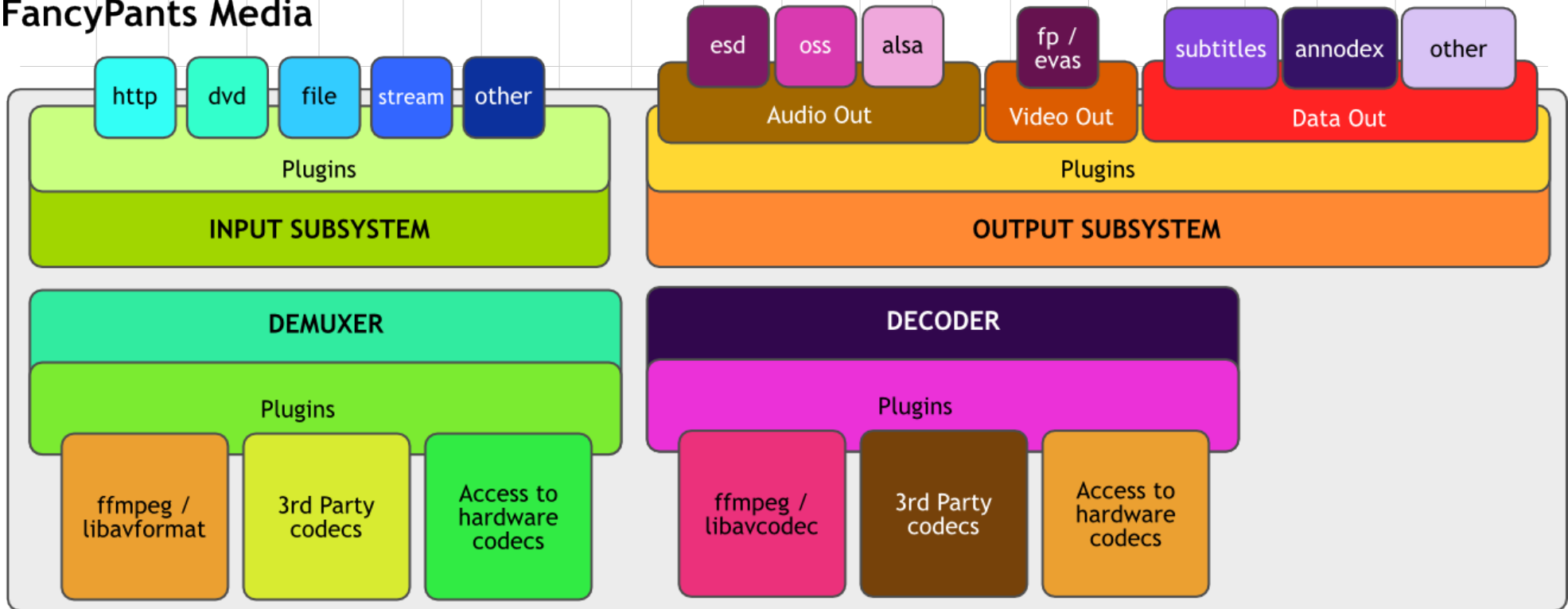
1. FancyPants Graphics	→	650 KB
2. FancyPants Media	→	500 KB - 1.5 MB [*]
3. FancyPants Canvas Server	→	40 - 50 KB

TOTAL:

650KB - 2.2MB

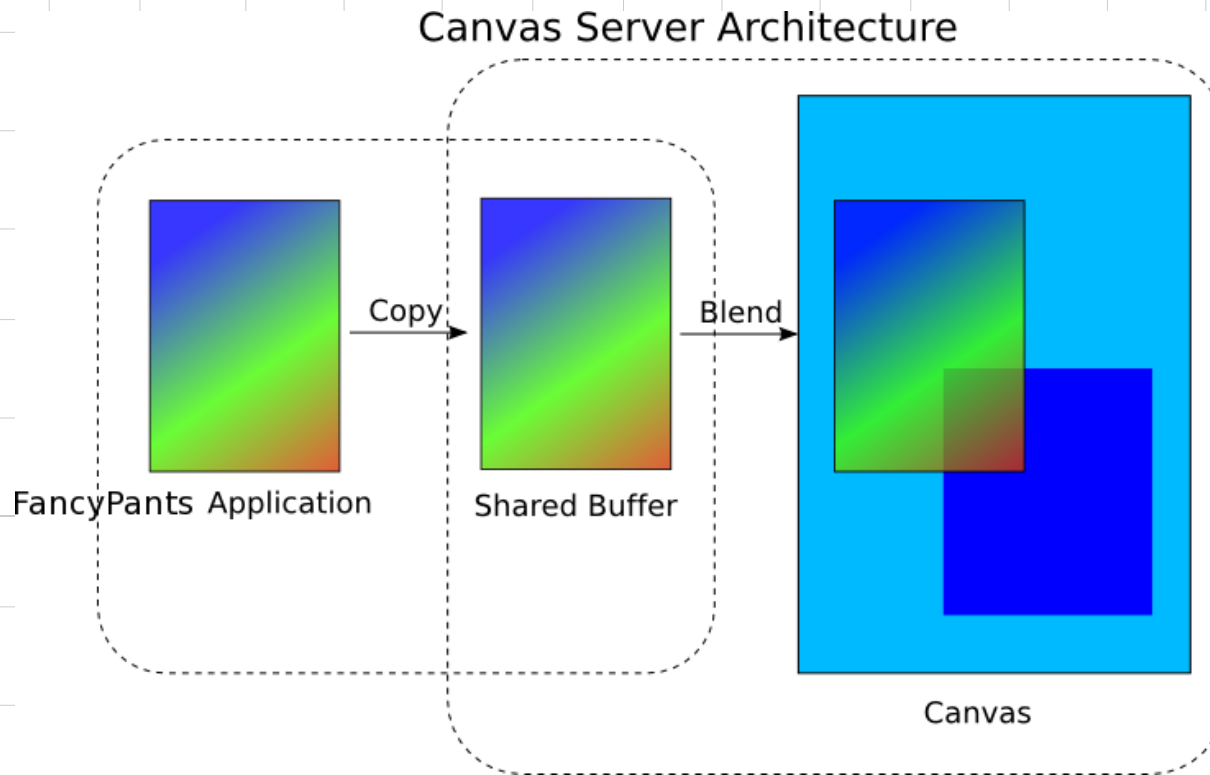
[*] Depending on codecs

FancyPants Media

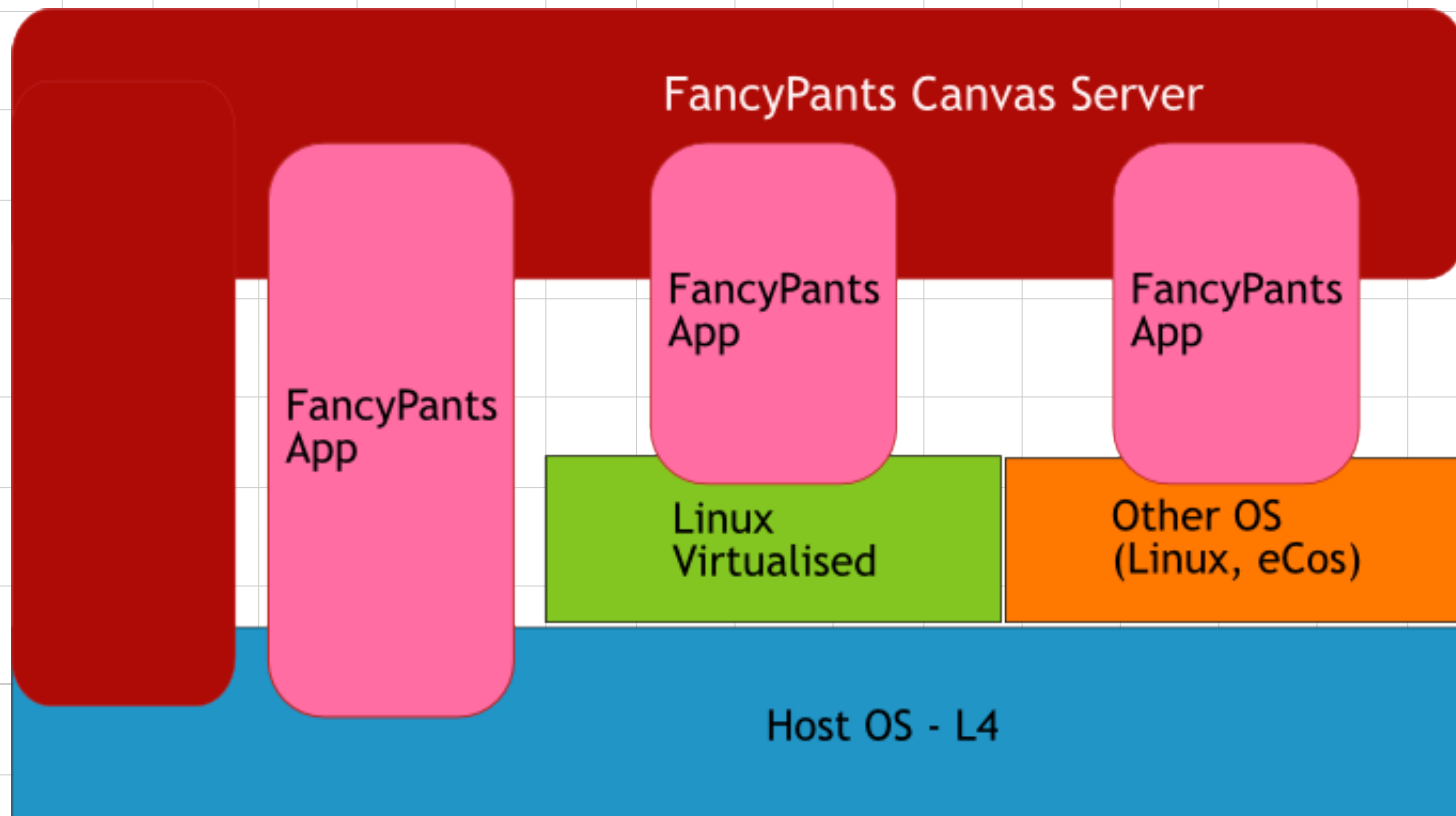


Canvas Server

- Very very small: 40-50KB install
- Minimal – in line with FancyPants philosophy
- Across multiple virtualised operating systems



Canvas Server: Multiple Operating Systems



API

- C
- Bindings
- Minimal design philosophy
- No wrapping “for completeness”
- About 20 widgets (included in 650KB)
- Simple way to create new widgets; Smart Widgets
- Exposed Evas API
- OO interface; Use Evas_Object
- Layers
- Grouped Layers via Smart Widgets

Example Media Player Code:

```
#include <stdio.h>
#include <Ecore_Evas.h>
#include <fp.h>
#include <media/fp_media.h>
```

```
int
fp_main(int argc, char **argv)
```

```
{
    struct fp    *fp;
    Evas_Object *bg;
    Evas_Object *media_obj;
```

```
    fp = fp_init(&argc, argv);
    fp_window_init(fp, "");
```

```
    media_obj = fp_media_add(fp);
    fp_media_file_set(media_obj, argv[1]);
    evas_object_show(media_obj);
    fp_media_audio_enabled_set(media_obj, 1);
    fp_media_state_set(media_obj, FP_PLAY);
```

```
    fp_begin(fp);
```

```
}
```

Same program for audio
and for video

Simple:

- 1) Add generic object
- 2) Press "PLAY"

Example Media Player Makefile

```
CFLAGS += `pkg-config --cflags fancypantsmedia`  
LDFLAGS += `pkg-config --libs fancypantsmedia`  
  
demo1: demo1.c
```

Example: Resizing Media

```
media_obj = fp_media_add(fp);  
fp_media_file_set(media_obj, argv[1]);  
evas_object_resize(media_obj, 400, 800);  
evas_object_show(media_obj);  
fp_media_audio_enabled_set(media_obj, 1);  
fp_media_state_set(media_obj, FP_PLAY);
```

Example: Resizing Media

```
media_obj = fp_media_add(fp);  
fp_media_file_set(media_obj, argv[1]);  
fp_media_video_keep_aspect_set(media_obj, 1);  
evas_object_resize(media_obj, 400, 800);  
evas_object_show(media_obj);  
fp_media_audio_enabled_set(media_obj, 1);  
fp_media_state_set(media_obj, FP_PLAY);
```

Summary



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<http://www.fancypants-graphics.com>



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